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ABSTRACT

Operant conditioning principles were used to promote verbalizations based on current event television news stories in three institutionalized 15-year-old retardates. Percentages of correct responses concerning the videotaped news segments were recorded in four experimental conditions: baseline, massed news with tokens and praise contingent on appropriate verbal response, news distributed over time without reinforcement, and distributed news with contingent tokens and praise. Results indicated that the use of reinforcement and distribution of the news positively affected the Ss' verbal behavior. Demonstrated was the affect on verbalization of antecedent conditions (exposure to television news), suggesting television's potential as an aid in language instruction. (CL)

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INCREASING MENTALLY RETARDED ADOLESCENTS' VERBALIZATIONS ABOUT CURRENT EVENTS

Ingo Keilitz, Dennis J. Tucker, and R. Don Horner

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INCREASING MENTALLY RETARDED ADOLESCENTS' VERBALIZATIONS ABOUT CURRENT EVENTS[1]

Ingo Keilitz, Dennis J. Tucker, and R. Don Horner

Parsons Research Center

This research demonstrated some of the antecedent and consequent conditions that influence complex verbal behavior in institutionalized mentally retarded adolescents. Three subjects' verbalizations related to current national and international events were recorded following exposures to television news programs. Control over relevant verbal behavior was obtained when the temporal distribution of the news telecast presentation or/and tokens plus adult praise were systematically varied.

Most institutionalized mentally retarded individuals have little knowledge of events occurring outside the institution. Few of them read newspapers or view television news programs. Fewer still verbalize what they read, hear or see. Although the functional analysis of the language of the mentally retarded has been extended to various speech problems such as plural usage (Guess, Sailor, Rutherford, & Baer, 1968; Guess, 1969; Sailor, 1971), verb usage (Schumaker & Sherman, 1970), adjectival inflection (Baer & Guess, 1971) and inappropriateness (Barton, 1970), the functional analysis of semantic content of language has received little attention. The present study attempted to apply principles of operant conditioning to the problem of inadequate language of mentally retarded adolescents, specifically, verbalizations related to current national and international events.

Research has amply demonstrated the effectiveness of reinforcement, especially in combination with imitative stimulus control, to establish, maintain and modify verbal behavior of retarded individuals (Lovaas, Berberich, Perloff, & Schaeffer, 1966; Baer, Peterson & Sherman, 1967; McReynolds, 1969). In the present study, commericial television news telecasts served as models and discriminative stimuli for the verbalization of three institutionalized retarded adolescents. In separate conditions of the study both antecedent stimulus events (news telecast presentation) and consequent stimulus events (social and token reinforcement) of the subject's verbal behavior were manipulated. In view of the lack of knowledge of the outside world among institutionalized individuals, it

was felt that an increase in the low frequency of verbal behavior concerned with current events would be a desirable training goal.

There is a glaring lack of data which reliably demonstrates the use of television as a training medium with retarded individuals (Commission on Instructional Technology, 1970; Striefel, 1972). Television was used as an instructional aid in a study by Phillips, Phillips, Fixsen, and Wolf (1971) in which they increased news watching and comprehension by pre-delinquent boys in a token economy system by making points contingent on correct answers on a "news quiz" following news broadcasts. Their study demonstrates effective use of television as an instructional aid with pre-delinquent boys and suggests the applicability of television as a language training medium with retarded individuals.

METHOD

Subjects

Three male adolescents, Ted, Greg and Danny, from the same living unit at Parsons (Kansas) State Hospital and Training Center, were selected to serve as subjects on the basis of available free time in their daily schedule. All were 15 yrs of age and had been residents of the institution approximately one year. Ted was described in hospital records as borderline retarded with a primary diagnosis of psychogenic mental retardation associated with emotional disturbance. Greg was described as moderately retarded with a primary diagnosis of mental retardation due to unknown prenatal influence. Danny's records described him as moderately retarded with a diagnosis of cultural familial retardation. Casual observation revealed Danny and Ted to be talkative and willing to engage others in conversation; Greg was less responsive to others and rarely offered spontaneous verbalizations.

Apparatus and Experimental Setting

Sessions were conducted in an 8½' by 18' room containing a small table holding a Sony television monitor (Model 110) and a Sony Videocorder (Model 3400). An experimenter, acting as primary observer, and a secondary observer, were present in the experimental room during all sessions. The second author served as experimenter and primary observer, and the first or third author served as secondary observer. The subject's chair faced the television receiver. Two desk-chairs for the two observers, one at each side of the subject's chair, held clipboards and pencils. The experimenter's chair

also held a plastic container of poker chips used as token reinforcement. The observer was seated close to the videocorder, operating it during sessions.

Definition and Recording of News Items

A major requirement for the functional analysis of behavioral events is the establishment of criteria which enable different observers to agree on the occurrence of these events. In order to meet this requirement, a "specific observational code" (Bijou, Peterson, & Ault, 1968) in which news telecasts were divided into separate news items and items into categories was developed for each news telecast.

Prior to each experimental session the news segment of the NBC Today show was videotaped. The NBC Today news telecast was chosen for its short duration, relatively complete news coverage and minimum of news analyses and editorials in its format. Two or three observers watched the live telecast and reviewed the videotape one or more times in order to develop the specific observational code for that session. Each complete telecast was divided into separate news items, and each item into four categories: subject, action, object and additional information.

News items were defined by the content of the news telecast, with a single item usually representing a single event in the news. Whenever several separate news items dealt with a single topic (e.g., presidential primaries, the Indochina war), each was considered a separate news item. Separate news items were identified by content, as well as cues presented by the news commentator's behavior (e.g., pausing, turning of script pages, etc.) and visual changes in the telecast.

Each news item was divided into subject, action, object and additional information categories. Each category consisted of a partial transcription of the actual telecast. The partial transcription was then recorded on a data sheet. A segment of a data sheet and observational code is presented in Figure 1.

Insert Figure 1 about here

The number of items comprising the daily observational code transcribed from the telecasts ranged from six to 14, with a mean of 9.0.

Measurement and Reliability

Data were recorded directly on the data sheets shown in Figure 1 which were located in front of the experimenter and observer. Verbal behavior of the subjects was scored in terms of its similarity to the observational code for that session. Four correct verbal responses, one per category, were possible for each separate news item on the observational code. Responses were scored as correct or incorrect. A correct verbal response was defined as one that was either a direct quote of the telecast dialogue transcribed on the code (i.e., verbal imitation of the telecast dialogue) or a close approximation or synonym for the category content (e.g., "burned" for "burst into flames"; "plane" for "airliner"; "gonna keep fighting" for "continue siege").

Reliability of observation and the adequacy of the observational codes were evaluated by having the experimenter and the observer stimultaneously but independently score the verbal behavior of the subjects. Inter-observer

reliability was measured by a comparison, category by category, of the observer's data sheet with that of the experimenter. Reliability was calculated by scoring each category as an agreement or disagreement and dividing the total number of agreements between the experimenter and observer by the number of total categories (or four times the total number of items) comprising the specific observational code for that day.

Reliability checks were conducted during all but eight sessions for Danny, nine for Ted, and 16 for Greg. The mean percentage inter-observer reliability for the four experimental conditions, Baseline; Massed News, Token plus Praise; Distributed News; and Distributed News, Tokens plus Praise was respectively 96.1%, 92.6%, 92.9% and 93.6% for Ted, 99.7%, 97.0%, 98.4% and 97.5% for Greg, and 93.4%, 92.4%, 90.4% and 94.3% for Danny.

Procedures

The experimental design combined a reversal technique and a multiple baseline technique across subjects (Baer, Wolf, Risley, 1968; Hall, Cristler, Cranston, & Tucker, 1970). $Baseline_1$ was in effect for the first six sessions for all three subjects. Delivery of tokens and praise during massed news presentation began on Session 7 and was discontinued on Session 18 for all subjects. Beginning Session 19 $Baseline_2$ was in effect for four sessions for Ted, seven sessions for Greg, and 10 sessions for Danny. The distributed news condition was successively applied to Ted, Greg and Danny and discontinued for all three on Session 39. A return to $Baseline_3$ for four sessions was followed by application of the distributed news, tokens plus praise, condition for nine sessions for all three subjects.

Subjects were brought into the experimental room individually to view the videotaped news segment of the NBC Today show. Each subject was instructed to seat himself in front of the blank television screen. When seated each subject was instructed as follows:

"We're going to watch the news on television. When it is over, I would like you to tell me about the things you saw and heard. OK?"

These instructions were repeated when necessary at the beginning of the first three sessions and discontinued thereafter. After the instructions were given by the experimenter, the observer turned on the television monitor. The subject, experimenter and observer remained in the experimental room during the showing of the taped news telecast. No data were taken while the telecast was in progress. No attempts were made by the experimenter or the observer to direct the subject's attention to the television screen. At all times during the telecast the experimenter and observer silently viewed the television screen.

At the end of the taped telecast (during Baseline and Massed News, Tokens plus Praise) or at the end of every specific news item (during Distribued News and Distributed News, Token plus Praise) the observer stopped the tape. The experimenter then said: "Tell me what you saw on the news." Verbal behavior following this statement was scored by the experimenter and observer directly onto the data sheet containing the specific observational code for that day. If all news categories were not mentioned by the subject, additional verbal behavior was prompted by the question: "What else did you see on the news?"

The study consisted of three phases, each preceded by baseline conditions. Details of procedure were as follows:

Baseline. During Baseline subjects were exposed to the entire news telecast prior to recording of verbal behavior. No programed consequences followed the subject's verbal behavior.

Verbal prompts were provided by the experimenter for those news item remaining unscored following the recording of verbal behavior in response to the questions "What else did you see on the news?" Unscored news items were defined as those news items on the observational code for which no verbal behavior was recorded in the subject, action and object category; an item for which verbal behavior was recorded in any of these categories was considered scored and no prompts were provided. Items for which only the additional information category was scored were prompted.

Verbal prompts, provided to render verbalization of specific items more probable, consisted of the following sentence, completed by insertion of the subject of the unscored item as transcribed in the observational code: "Can you tell me anything about _____?" (e.g., President Nixon, American bombers, space scientists). Verbal behavior following prompts was scored in the same fashion as unprompted verbal behavior with the exception of verbalization related to the subject. When the subject of the item was used in the prompt, the subject category was scored as a prompt. Verbal prompts continued until all news items on the observational code for that session were scored as correct, incorrect or prompted. After all items were either scored or prompted the session was terminated.

Massed News, Tokens plus Praise. In this phase, conditions remained unchanged from those in Baseline except that tokens and praise (i.e., "Very good") were delivered by the experimenter contingent upon appropriate verbal behavior. At the beginning of the first session of this condition, a non-contingent token was delivered to each subject and exchanged for one penny to demonstrate the availability of tokens and the one-to-one exchange ratio.

A single token was awarded for every item category (i.e., subject, action, object and additional information) correctly verbalized. As in the Baseline conditions, all unscored items were verbally prompted until the list of news items on the observational code was exhausted.

Distributed News, No Tokens or Praise. During this condition the taped news was not presented in its entirety, but distributed over time to determine the effects of the antecedent stimulus conditions on the verbal behavior of the subjects. At the beginning of the first session of this condition, subjects were told that they would not be shown the entire news telecast at one time, but would be given opportunities to tell the experimenter what they saw after viewing smaller segments of the news.

Distributed News, Tokens plus Praise. The two experimental variables applied separately earlier in the study, experimenter reinforcement and altered telecast presentation, were combined in this phase. News items were presented separately and tokens plus praise were awarded contingent upon correct verbal behavior. There were no verbal prompts provided during this condition. All news items were presented until the list for that day was exhausted.

RESULTS

The percent of correct verbal behavior demonstrated by the three subjects following videotaped news telecasts over 52 sessions is presented in Figures 2 and 3. Percentages were calculated for each session by dividing the number of correctly verbalized news item categories by the total number of categories.

Insert Figures 2 and 3 about here

During Baseline$_1$ the three subjects demonstrated little verbal behavior. Percentage of correct verbal behavior exceeded 15% only during Sessions 1 and 5 for Ted.

When tokens and adult social praise were provided contingent on correct verbal behavior Ted and Danny's performance increased considerably over that of Baseline$_1$. By Session 18, Ted's verbal behavior had reached 46% whereas the average during Baseline$_1$ was 12.2%. Similarly, Danny reached 41% on Session 18 while his average during Baseline$_1$ was 10.3%. The effects of tokens and praise on Greg's verbal behavior were less dramatic, although he did improve his performance over that demonstrated during Baseline$_1$.

Following the introduction of Baseline$_2$ in Session 19, the verbal behavior of all three subjects diminished to levels below those exhibited when tokens and adult social praise were response contingent. By Sessions 25 and 28, respectively, Greg and Danny's performance had deteriorated to levels demonstrated during Baseline$_1$. Ted, however, exhibited approximately twice the verbal behavior during the reinstatement of baseline conditions as he did during Baseline$_1$, indicating that a large part of his verbal behavior did not depend on the provision of response contingent tokens and praise.

The introduction of distributed news items after varying lengths of baseline for the three subjects caused an increase in the correct verbal behavior of all three subjects. The application of the multiple baseline technique demonstrated that the change in correct verbal behavior was due to alteration of the news telecast presentation and not due to practice or coincidence. All three subjects recovered and surpassed the performance levels previously demonstrated when news presentations were massed and tokens plus praise were provided for correct verbal behavior. Session 40, marking the introduction of $Baseline_3$, produced a marked deterioration in the performance of all three subjects.

At Session 44 the news telecasts were distributed over time, and tokens plus adult social praise were provided for correct verbalizations. The introduction of these variables produced its most dramatic effect on Greg whose correct verbalizations increased from 0% in Session 43, the last session of $Baseline_3$, to 35% in Session 52. Inspection of Greg's data in Figure 2 reveals that neither the separate application of response contingent consequences nor alteration of antecedent stimulus conditions substantially affected his verbal behavior, but that the concurrent application of these variables was effective in increasing his correct verbalizations. Ted also exhibited more correct verbal behavior when these two variables were applied concurrently. Danny, on the other hand, barely recovered the percentage of of verbal behavior maintained by the distributed news condition in the absence of experimenter reinforcement. Apparently, tokens and adult praise contingent on correct verbalizations had only minimal effect on Danny's performance when news telecasts were distributed over time.

DISCUSSION

The present study demonstrated that a class of complex verbal operants, in this case verbalizations related to current events, can be affected by their consequences as well as by antecedent stimulus conditions. Operant research has amply demonstrated that verbal behavior can be affected by its consequences. So far, much less attention has been given to the antecedent conditions that affect verbal behavior (Mann & Baer, 1971). The present results suggest that relatively complex verbal behavior can be increased by exposure to the proper type of antecedent stimulus conditions. Specifically, exposure to television news, temporally distributed to provide the optimal climate for receptive language, can increase verbalization by mentally retarded adolescents in relation to the televised news.

Although both the reinforcement procedure (tokens and praise) and the temporal distribution of news had positive effects on all three subject's correct verbal behavior when applied alone, their effects were not additive for all three subjects. The contingent delivery of tokens and praise and the temporal distribution of the news were complementary in the case of Greg and Ted in that they both demonstrated more correct verbal behavior during concurrent application of the two variables than when these variables were applied alone. The effects of concurrent application were truly additive in the case of Greg, who demonstrated few correct verbalizations when reinforcement or news distribution were used alone. In Danny's case, however, the effects of concurrent manipulation of antecedent and consequent events were not complementary. Danny barely recovered the performance level during

concurrent application of distributed news and reinforcing events that he exhibited when the news was distributed in the absence of experimenter reinforcement. These results point out that in order to analyze the controlling components of complex verbal behavior one must consider not only the separate effects of antecedent events or setting events (Kantor, 1958) and consequent events, but also the effects of interactions when these events are simultaneously operative.

A rather surprising aspect of the results concerns the continued occurrence of correct verbalizations in the distributed news condition. All three subjects continued to verbalize current events items despite the absence of experimenter reinforcement. There may be several explanations why such verbal behavior is maintained. Correct verbalizations may have been maintained, although unreinforced, simply because they were similar to the telecast news items. Such an explanation is supported by findings that the property of being similar to a model may function to maintain imitative and non-imitative responses (Baer, Peterson, & Sherman, 1967; Peterson, 1968). Similarly, television may have functioned as both a discriminative stimulus or model and a reinforcing stimulus. A study by Baer and Sherman (1964) demonstrated the effectiveness of a talking puppet as both a model and a source of reinforcement for imitative behavior in young children. Finally, since television viewing is a generally popular activitiy, it is equally plausible that the verbal behavior of the subjects was maintained simply by the opportunities for continued television viewing. Research with retarded and non-retarded individuals has demonstrated that television can be an effective reinforcer for a variety of behaviors (Baer, 1962; Lindsley, 1962; Green & Hoats, 1962; see also Whaley & Mallot, 1971).

The present research demonstrates the efficacy of television as an instructional aid with retarded individuals. Although proven effective in the training of normal individuals (Ball & Boyatz, 1970), the uses of television to train language skills in mentally retarded individuals have received little attention. The obvious advantages of television, used as an educational tool with the institutionalized mentally retarded, are its accessibility and universality. There is hardly a school or institution that does not have one or more accessible television set. Moreover, a retarded individual in an institution can view the identical program at the same time as his "normal" peer outside the institution, thereby closing the gap between institutionalized and community living. Providing the mentally retarded with a climate for language growth is difficult, due to a lack of appropriate models. Commercial and educational television programing provides an economical and efficient means whereby individuals can be exposed to hours of appropriate language per day. The present data suggest that when such exposure is properly controlled and verbalizations following such exposure are reinforced, television can become a powerful tool for language development and modification.

Several constraints as well as suggestions for further research can be mentioned. In the present study news telecasts were presented to the subjects individually. The experimenter and an observer were present at all times during the viewing of the news telecast and the subsequent reporting of the news items by the subjects. Also, the live telecasts were videotaped using relatively expensive equipment. In an institutional setting where the

requirements of minimum accomodation on the part of the ward staff and other personnel and minimum expense are tantamount, the application of the methods reported may be prohibitive. Ideally, the procedures described here should be applied in a natural setting with maximum accommodation to the daily routine of an entire group of individuals. For example, live television using a standard television monitor could be presented to available individuals at specific times. Data on attendance of viewing sessions, as well as frequency and appropriateness of verbal behavior, could provide valuable information on the effectiveness of television as an instructional aid. Furthermore, the content of the television program viewed need not be current events. Educational programs as well as commercial entertainment programs could be presented as a source of language. Such exposure to language could be highly relevant to acquisition of productive speech in the mentally retarded.

Thus, the generality of the present results depends on further research under a number of differing conditions. The constraints and improvements suggested, however, do not detract from the empirical demonstration that relatively complex verbal behavior related to current events can be increased in mentally retarded individuals by the proper exposure to antecedent stimulus conditions and provision of positive reinforcement.

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Footnote

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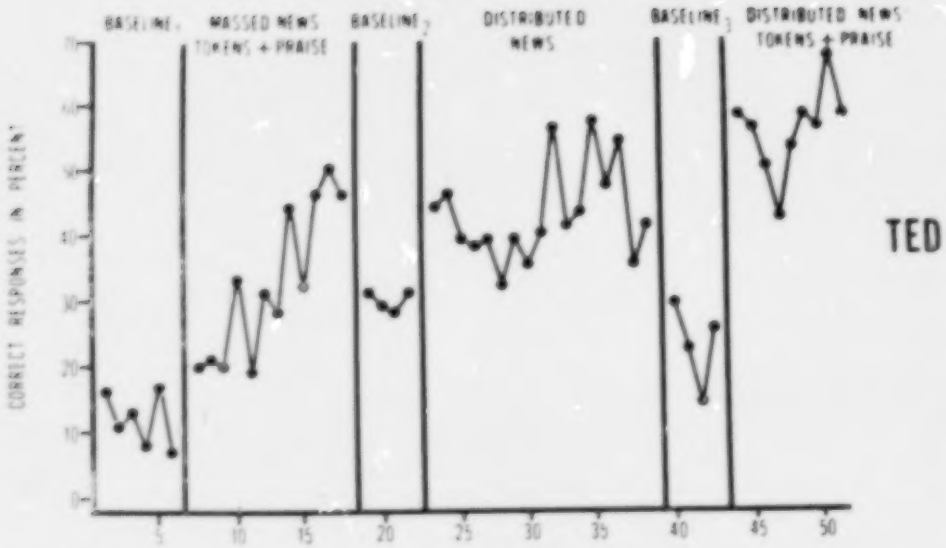
Figure Legends

Figure 1. A segment of the observational code and data sheet from the news telecast of June 27, 1972.

Figure 2. Percentage of Ted and Greg's verbal behavior related to current events over 52 sessions. $\underline{\text{Baseline}}_1$--massed news, no programmed consequences. Massed News, Tokens plus Praise--reinforcement was delivered contingent on correct verbalizations following uninterrupted presentation of entire news telecast. $\underline{\text{Baseline}}_2$--reinstatement of Baseline_1. Distributed News--news presentation was temporally spaced with interspersed opportunities for verbal behavior between news items. $\underline{\text{Baseline}}_3$--reinstatement of Baseline_1. Distributed News, Tokens plus Praise--news presentation was temporally spaced and reinforcement was delivered contingent on correct verbal behavior.

Figure 3. Percentage of Danny's verbal behavior related to current events over 52 sessions. $\underline{\text{Baseline}}_1$--massed news, no programmed consequences. Massed News, Tokens plus Praise--reinforcement was delivered contingent on correct verbalizations following uninterrupted presentation of entire news telecast. $\underline{\text{Baseline}}_2$--reinstatement of Baseline_1. Distributed News--news presentation was temporally spaced with interspersed opportunities for verbal behavior between news items. $\underline{\text{Baseline}}_3$--reinstatement of Baseline_1. Distributed News, Tokens plus Praise--news presentation was temporally spaced and reinforcement was delivered contingent on correct verbal behavior.

SUBJECT	ACTION	OBJECT	ADDITIONAL INFORMATION
floods	destroyed	homes	Indian state of Assam; many dead and missing
men	killed	in helicopter crash	Harrisburg, Pa. CBS correspondent
Indiana farmer (Lowell Elliott)	found	ransom money	soy bean field; no trace of hyjacker; American Airlines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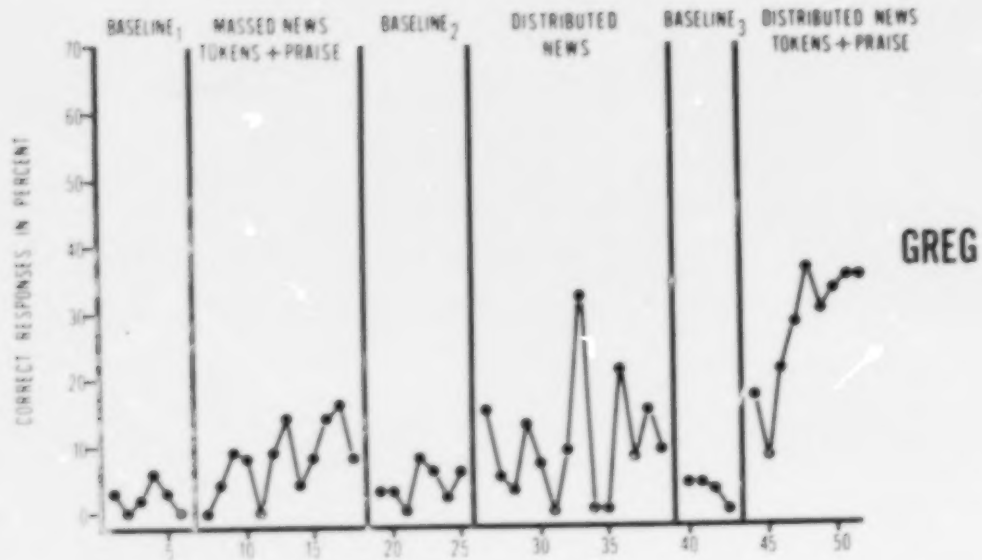
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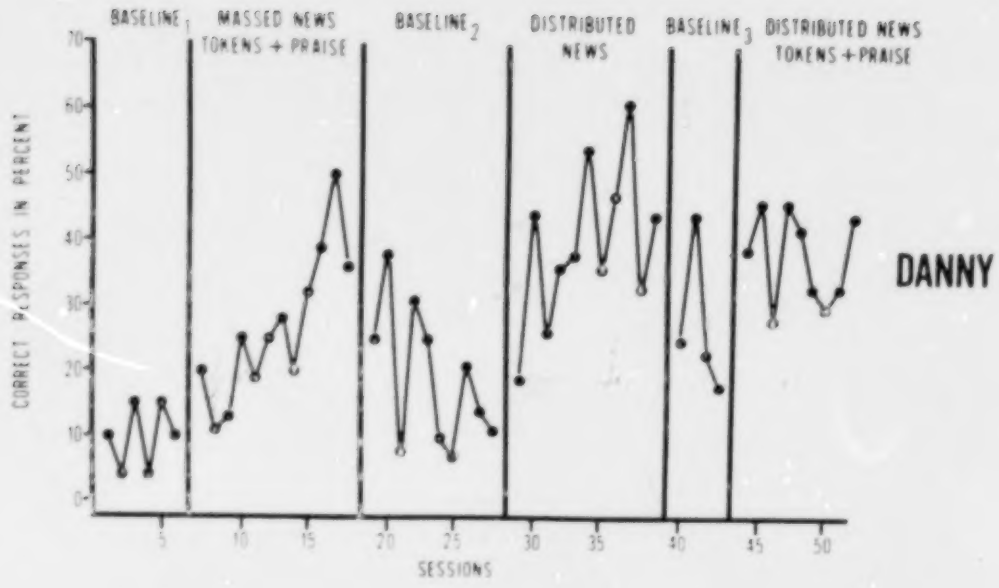
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